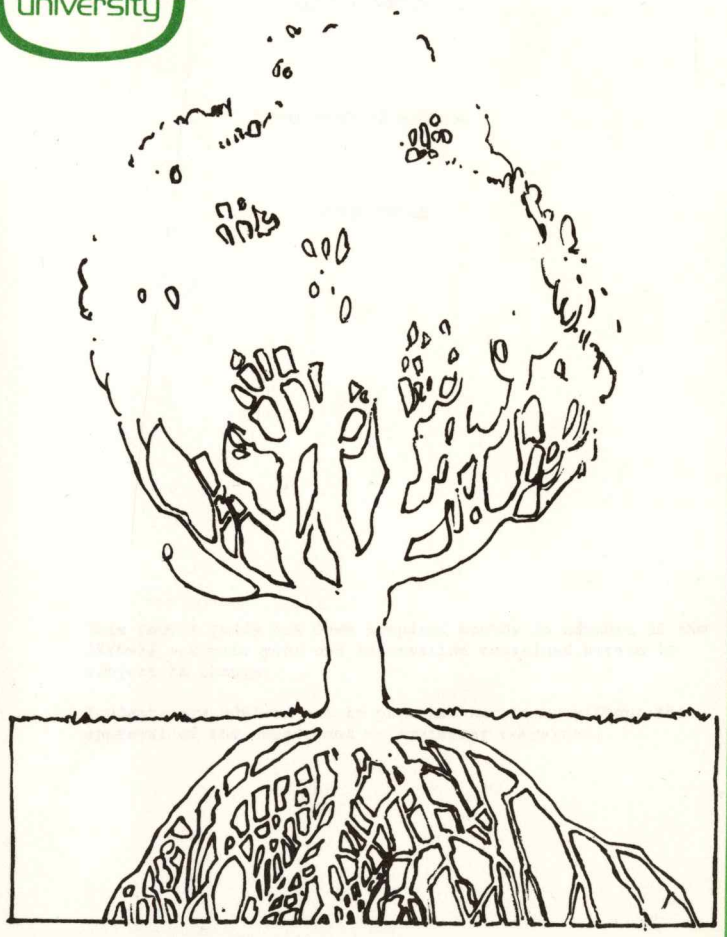
Science

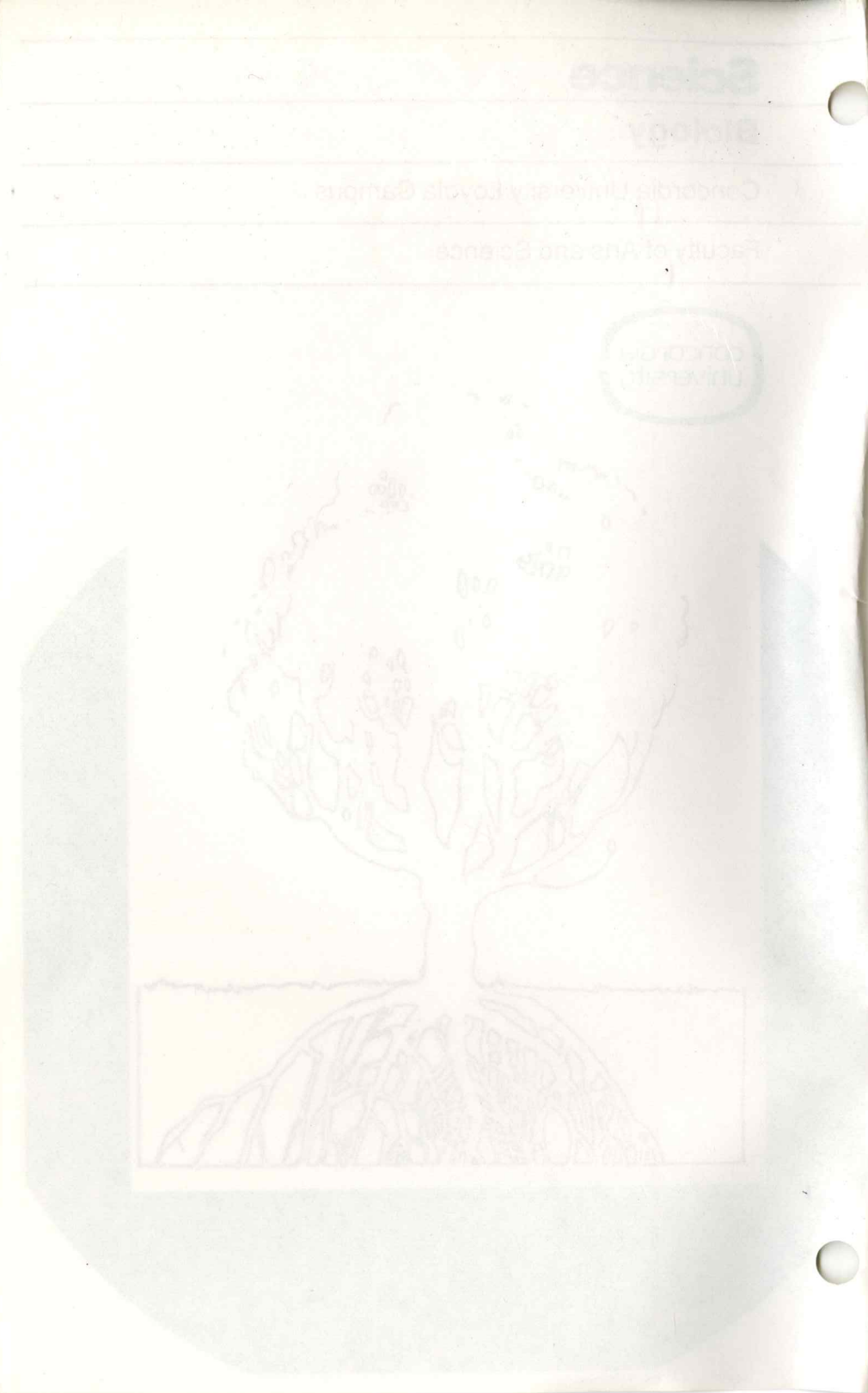
Biology

Concordia University Loyola Campus

Faculty of Arts and Science

concordia university





concordia university

LOYOLA CAMPUS

DEPARTMENT OF BIOLOGY

COURSE GUIDE

This course guide has been prepared months in advance of the 1976-77 academic year and information contained herein is subject to change.

Students are advised not to purchase any texts without the approval of the department or professor concerned.

Full-Time Faculty

Associate Professor and Chairman of Department:

R.T. Cronin, S.J., Ph.D. (Fordham)

Professor:

S. Drummond, S.J., Ph.D. (Toronto)

Associate Professor:

K.S. Dhindsa, Ph.D. (Helsinki)

Assistant Professors:

P.J. Albert, Ph.D. (New Brunswick)

C. Beckman, Ph.D. (Rutgers)

N.N. Kapoor, Ph.D. (McMaster)

B.S. Mangat, Ph.D. (London)

J.D. McLaughlin, Ph.D. (New Brunswick)

R.G. Omran, Ph.D. (Texas A & M)

P. Widden, Ph.D. (Calgary)

Information:

Students are welcome to visit the department anytime to discuss any aspect of the programme with the members of the faculty. For any information, please contact:

Dr. R.T. Cronin, S.J.

Telephone: 482-0320, ext. 302

BACHELOR OF SCIENCE DEGREE

Students wishing to register for the B.Sc. in this Department must have the CEGEP Diploma in Science, including the following courses or their equivalents:

1 course in Biology	(301; 401)
2 courses in Physics	(102; 202)
2 courses in Chemistry	(101; 201)
2 courses in Mathematics	(103; 203)

To complete the requirements for the Bachelor of Science degree, they will take a minimum of 90 credits. Each credit represents a minimum of 45 hours, spread across the total activity of lectures, laboratories, seminars and private study. Sixty (60) of these must be taken from courses offered in the Faculty of Arts & Sciences as specified in the student's Department offerings.

PROGRAMMES

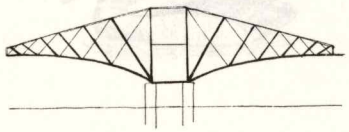
Students will register in the programme of their choice, after consultation with members of the Department faculty and approval of the Department Chairman.

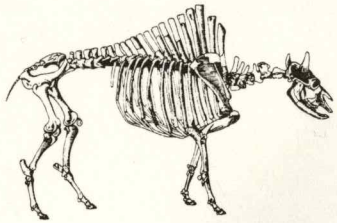
The Department offers the following programmes:

Honours, Specialization, Major-Minor

COUNSELLING

Students will be expected to choose, from among the Departmental faculty, their own academic advisor. who will from time to time sit down with them and talk about areas of specialization, courses, options, careers, etc.





BIOLOGY 201A/B
INTRODUCTORY BIOLOGY (3 credits)

Instructor: To be announced.

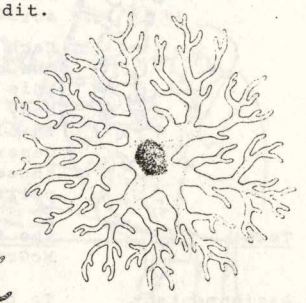
Description: Requiring no previous biology, this survey course conducts the student through the major branches of life sciences such as botany and zoology, physiology and genetics, which it is hoped will lay the foundation for more detailed in-depth studies at higher levels. Some previous knowledge of general chemistry is necessary for the examination of cellular metabolism and photosynthesis in particular. Broader themes, such as evolution and environmental biology are considered, as well as specific phenomena, such as mitosis and meiosis, hormonal and enzyme control, etc. In general, this course is the equivalent of the biology courses, 301 or 401, offered in the CEGEP's. In the laboratory, the student is exposed to selected examples of the major plant divisions and animal phyla, with expectation of gaining a comparative knowledge of living anatomy, both plant and animal, as well as learning rudimentary skills of dissection, examination and representation.

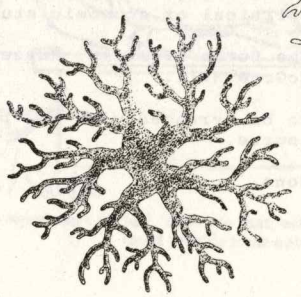
This course is also available to non-Biology students for university credit.

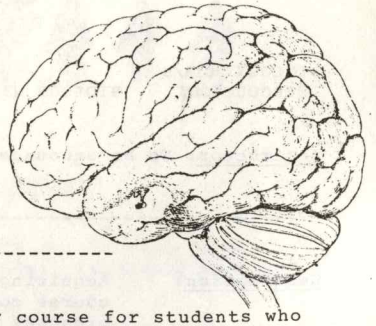
Text: To be announced.

Grading: Theory: 60%
Laboratory: 40%

Prerequisite: Chem. 112Z or equivalent.







BIOLOGY 300Z
FUNDAMENTALS OF HUMAN BIOLOGY (6 credits)

Instructor: Dr. S.P. Drummond, S.J.

Description: This is an introductory course for students who have an interest in human biology. It is not suitable for Biology Students. The course discusses life processes in a non-technical manner, employing lectures, demonstrations, audio-visual presentations and discussions. The course probes problems not only of organization and functions, but also of health and disease, with a view to a more meaningful and happy life. The fertilized cell is independently capable of developing all the inter-dependent systems of the adult, requiring only food and protection from outside itself.

These systems are considered at various levels: a) the working unit b) the support unit c) the control unit d) the defense unit e) the hereditary unit.

The senses - the windows of the mind, and the brain centers - for storage and retrieval of sense data, serve as the basis for intellectual activities.

Each of us can apply the principles, outlined in the course, along the lines of our own interests. This may be an understanding of the unity of body and soul at the level of Biology, Philosophy, Theology, or of interpersonal relationships. Generally, the course should prove useful for those engaged in psychological, sociological, political or economic studies.

Text: The Human Organism: Russel DeCoursey, 4th Ed. McGraw-Hill.

Assignments & Grading: To be arranged with the participants in the course.

Prerequisite: None.

BIOLOGY 304Z
CONCEPTS OF MODERN BIOLOGY (6 credits)

Instructor: Dr. J.D. McLaughlin

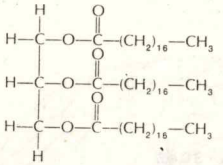
Description: Designed for the student who does not intend to continue in biology or related fields, this course exposes the general student to the marvels and mysteries of the biosphere, the great diversity of plant and animal life forms which co-inhabit this planet with us, our dependence and responsibilities in their preservation, cultivation and appreciation. While omitting much technical terminology, the course will introduce the interested student to basic anatomy and physiology common to most living creatures including man himself. Aspects of evolution, metabolism, heredity and genetic engineering will also be covered. There is no laboratory.

Text: To be announced.

Grading: To be determined during the first week of lectures.

Prerequisite: None.

"The report isn't all bad. They say that, eaten with warm milk, the *box* could provide some nutrition."



BIOLOGY 311A/B
INTRODUCTORY BOTANY (3 credits)

Instructor: To be announced.

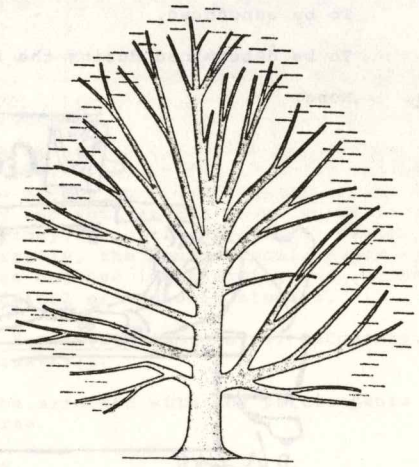
Description: An introductory lecture and laboratory course designed to acquaint students with plant biology. As an introductory course, a wide range of topics are considered, beginning with the cell as the unit of structure. Three main areas of concentration are emphasized, namely: the structural organization of plants, their functional activities and their wide diversity. Emphasis is also placed on the patterns of reproduction and the economic importance of plants. Lectures: 3 hours per week for one term. Labs: 3 hours per week for one term.

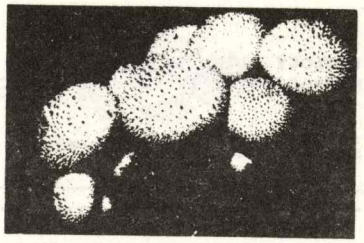
Text: To be assigned.

Grading: a) Laboratory 40% (Two lab. tests worth 10% each and lab. write-ups worth 15%).

b) Theory 60% (Two class tests worth 10% each and final worth 40%).

Prerequisite: CEGEP Sciences.





BIOLOGY 315A
MICROBIOLOGY I (3 credits)

Instructor: To be announced.

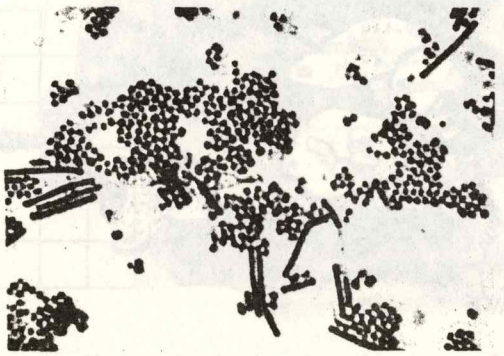
Description: An introduction to micro-organisms: the history and methodology of microbiology, the procaryotic and eucaryotic levels of organisation, the structure and function of viruses, bacteria and fungi. Lectures: 2 hours per week for one term. Lab: 3 hours per week for one term.

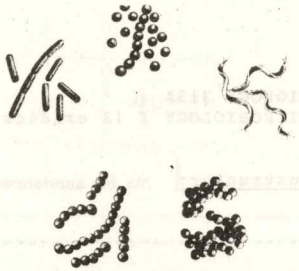
Text: The Microbial World. Stanier, Doudorof and Adelbery. Prentice-Hall.

Grading:

Essay:	15%
Labs:	10%
Lab Exam:	25%
Mid term:	15%
Final:	35%

Prerequisite: CEGEP sciences.





BIOLOGY 317B
MICROBIOLOGY II (3 credits)

Instructor: To be announced.

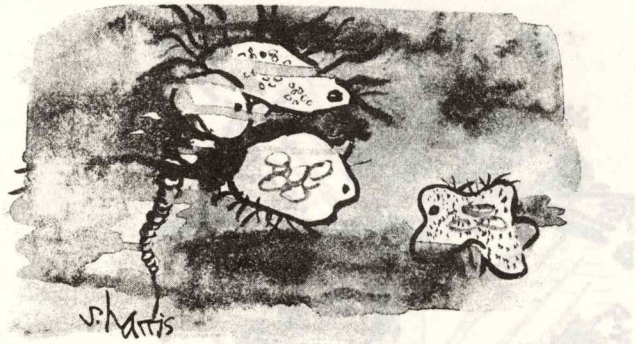
Description: This course is designed to follow 315A and will cover the genetics, growth, nutrition, metabolism and ecology of micro-organisms. Stress will be placed on energy yielding mechanisms peculiar to bacteria and on the importance of micro-organisms as biochemical and genetic tools as well as their importance in medicine and industry. Lectures: 2 hours per week for one term. Lab: 3 hours per week for one term.

Text: The Microbial World. Stanier, Doudorof and Adelberg. Prentice-Hall.

Grading:

Essay:	15%
Labs:	10%
Lab Exam:	25%
Mid term:	15%
Final:	35%

Prerequisite: Biol. 315A.



"This new drug works on streptococci, pneumococci, and staphylococci. Now here's where you come in..."

BIOLOGY 321A/B
INTRODUCTORY ZOOLOGY (3 credits)

Instructor: Dr. P.J. Albert

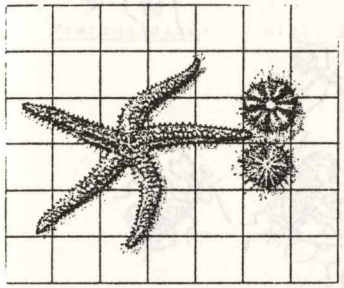
Description: A basic study of the morphology and physiology of a selected series of invertebrate and vertebrate animals together with elements of cytology, genetics, evolution, ecology and the geographical distribution of animals. Lectures: 3 hours per week for one term. Labs: 3 hours per week for one term.

Text: To be announced.

Grading:

Midterm test:	10%
Labs:	20%
Lab exam:	20%
Final exam:	50%

Prerequisite: CEGEP sciences.



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O	25.5
C	9.5
N	1.4
Ca	.31
P	.22
Cl	.03
K	.06
S	.05
Na	.03
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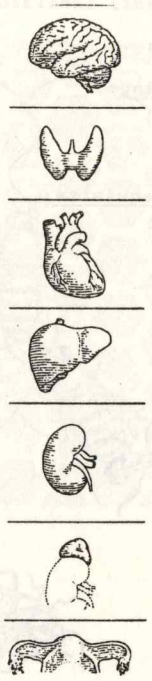


BIOLOGY 327A
ENTOMOLOGY I (3 credits)

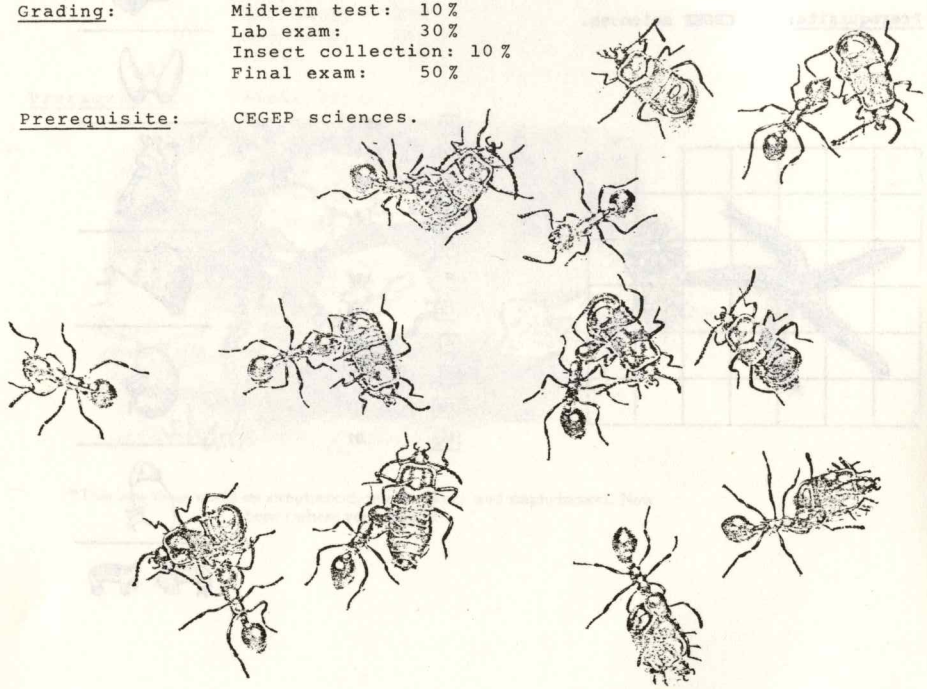
Instructor: Dr. P.J. Albert

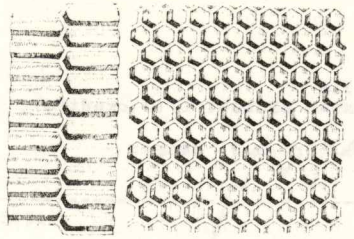
Description: This course introduces the student to the variety and complexity of insect life. Basic classification is followed by a more detailed study of morphology and anatomy, together with some physiological considerations including growth and metamorphosis. Other topics such as adaptations for aquatic life, social behaviour, etc. will also be discussed. Lectures: 2 hours per week for one term. Labs: 3 hours per week for one term. Insect collection leaflets available at Office - for summer collecting.

Text: To be announced.

Grading:
Midterm test: 10%
Lab exam: 30%
Insect collection: 10%
Final exam: 50%

Prerequisite: CEGEP sciences.





BIOLOGY 329B
ENTOMOLOGY II (3 credits)

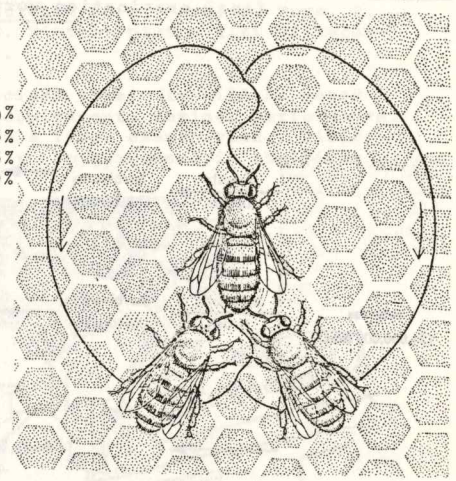
Instructor: Dr. P.J. Albert

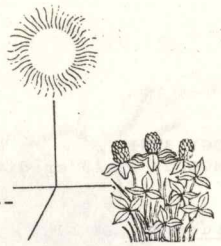
Description: To the initiated student, this course will present an in-depth study of insect behaviour. Topics will include: sensory physiology, insects and plants, light and sound production, population dynamics and insect ecology, etc. An attempt will be made throughout the course to establish a web of interrelationships between the structure and function of various insect parts. Laboratories will involve the use of live animals and the student may be required to spend additional time for certain experiments.

Text: Assigned readings.

Grading:
Midterm test: 10%
Lab reports: 25%
Seminar: 15%
Final exam: 50%

Prerequisite: Biol. 327A





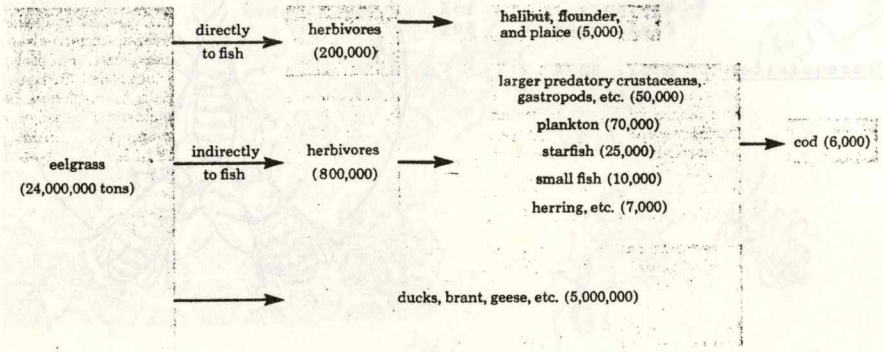
BIOLOGY 331A
ENVIRONMENTAL BIOLOGY I (3 credits)

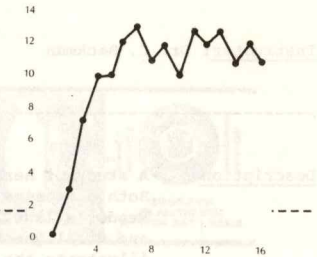
Instructor: Dr. B.S. Mangat

Description: This course is designed for the general student body and presents the fundamental concepts and principles underlying the relations between living organisms and their environment. It covers, at an introductory level, such areas as energy flow and trophic structure, interaction of the environment with populations and communities and relevance of ecology to human affairs.

Text: A list of recommended readings held in the Science Library.

Grading: Evaluation is by two class tests worth 20% each and a final examination worth 60%.





BIOLOGY 333B
ENVIRONMENTAL BIOLOGY II (3 credits)

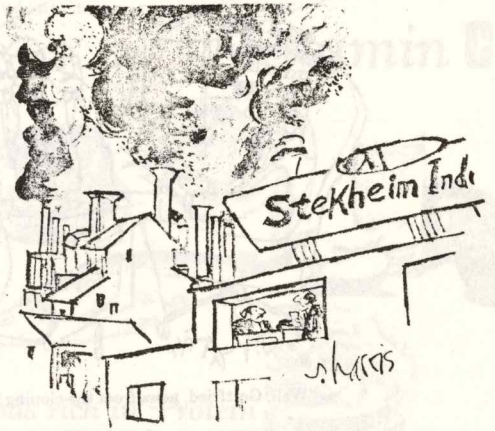
Instructor: Dr. B.S. Mangat

Description: The course is designed to follow Biology 331A and the course considers both natural and man-made ecological problems (water, air and land pollution), misuse of the natural environment and the problem of over population. Resource and waste control management and man's sociological responsibilities. The course will consist of lectures, seminars and tutorials.

Text: Environmental Science by A. Turk, J. Turk, J. T. Wittes and R. Wittes, plus a list of recommended readings.

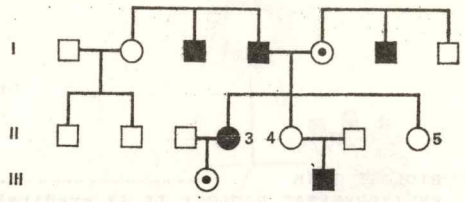
Grading: Dependent upon class size. It will be based on a practical assignment, seminar performance, a class test and a final examination. Distribution of marks to be discussed in the first lecture.

Prerequisite: none.



"Congratulations. They've named a lung disease after you."

BIOLOGY 335A/B
ELEMENTARY GENETICS (3 credits)



Instructor: Dr. C. Beckman

Description: A study of heredity for students who are not majoring in Biology. Both historical and current topics are considered. Topics include Mendel's laws, linkage, chromosome abberations, mutation, bacterial and viral genetics and evolution. Many of the examples used to illustrate the topics come from the genetics of plants and animals other than man; however, some material deals with human examples. Lectures only.

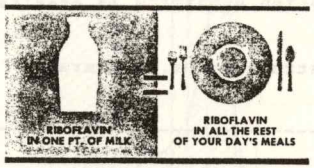
Text: To be announced.

Assignments & Grading: 3 written examinations.

Prerequisite: None.

"Well, Gottfried, news from the cloning front, I see!"

BIOLOGY 341A
FUNDAMENTAL NUTRITION (3 credits)



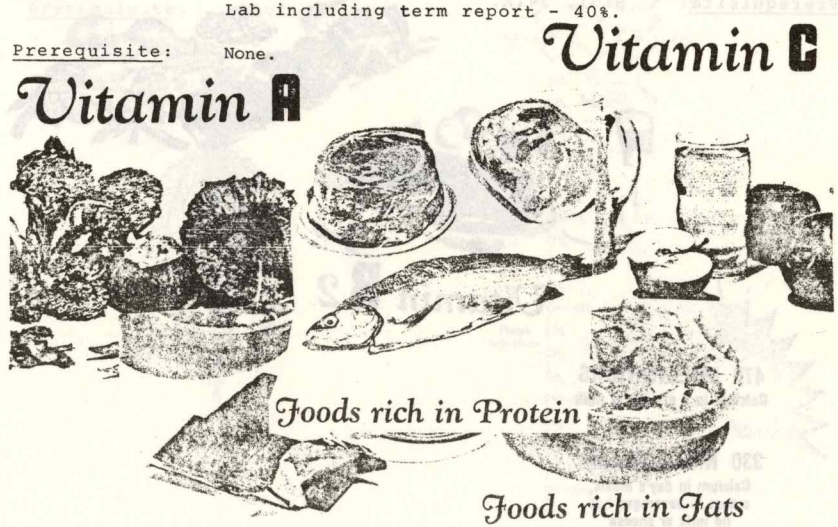
Instructor: Dr. R. Omran

Description: The course is designed to provide Biology majors and non majors with the basic knowledge of nutrition, food composition (carbohydrate, protein, fat, vitamins, etc.), its absorption and utilization, the role of excesses, toxins, additives, preservatives, food technology, and malnutrition. In addition to lectures, the course includes a laboratory, different foods to be analized for the contents of sugars, fats, vitamins, etc. Also speakers (nutritionists), movies and group discussion.

Text: Introductory Nutrition by H. Guthrie Mosby Company.

Grading: Theory - 60%.
Lab including term report - 40%.

Prerequisite: None.



BIOLOGY 343B
APPLIED NUTRITION (3 credits)

Instructor: Dr. R. Omran

Description: This course deals with the science of food and health with particular emphasis on current problems in human nutrition. Identification of food born disease and methods of prevention and control. The biodeterioration of food, the biochemical changes in food. Example: Post harvest changes in fruits and vegetables. Also laboratory to examine the dietary deficiency on experimental animals. The determination of mercury and lead in food and the microbiological examination of some food products. Speakers, movies, projects and group discussion.

Text: None, there is a short required reading list.

Grading: Theory: 60%
Lab.:40%

Prerequisite: Biol. 341A.

MILK: Children (up to about 11 yrs.) 2½ cups (20 fl. oz.)
Adolescents.....4 cups (32 fl. oz.)
Adults.....1½ cups (12 fl. oz.)
Expectant and nursing mothers....4 cups (32 fl. oz.)

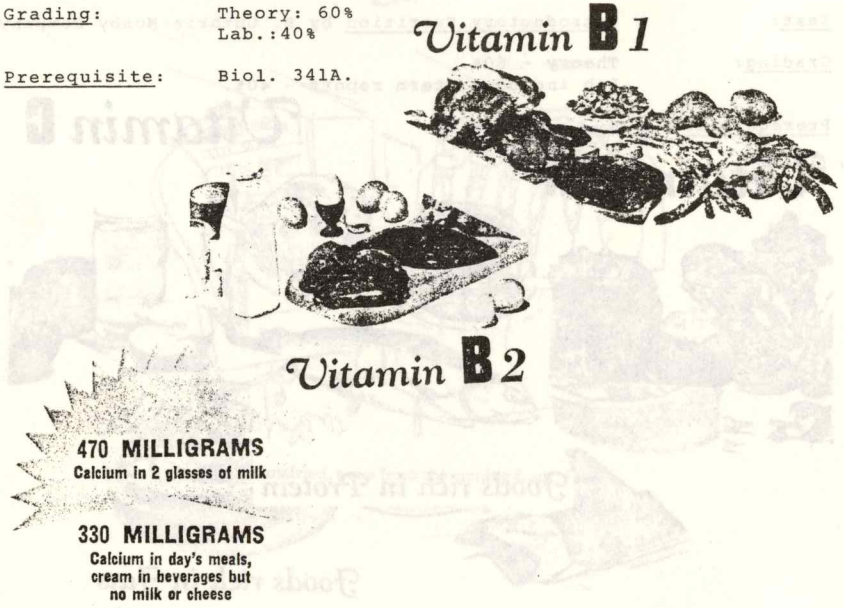
FRUIT: Two servings of fruit or juice including a satisfactory source of vitamin C (ascorbic acid) such as oranges, tomatoes, vitaminized apple juice.

VEGETABLES: One serving of potatoes.
Two servings of other vegetables, preferably yellow or green and often raw.

BREADS AND CEREAL
fied margarine).
One serving of whole gr

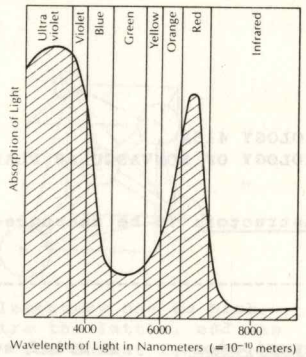
MEAT AND FISH: One
Eat liver occasionally.
Eggs, cheese, dried beans
of meat.
In addition, eggs and ch
week.

VITAMIN D: 400 Intern
persons and expectant an


Vitamin B1
Vitamin B2
470 MILLIGRAMS
Calcium in 2 glasses of milk
330 MILLIGRAMS
Calcium in day's meals, cream in beverages but no milk or cheese

BIOLOGY 410Z
PLANT PHYSIOLOGY (6 credits)

Instructor: Dr. R. Omran

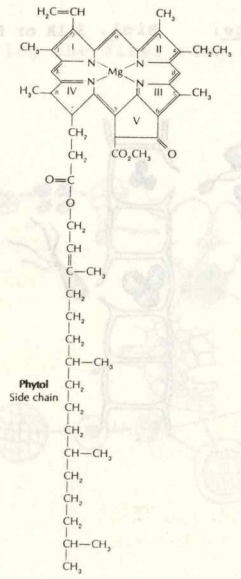


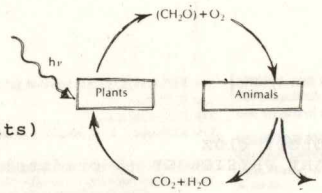
Description: A study of important plant metabolic processes with emphasis on the metabolism of carbohydrate, proteins and lipids (membrane characteristics and permeability, enzymes, light and photosynthesis, respiration and nitrogen metabolism). The laboratory covers a broad spectrum of basic physiological concepts and techniques: spectrophotometry, chromatography, extraction analysis, water relations and biosynthesis.

Text: Plant Physiology by R.G.S. Bidwell.

Grading: Theory: 60%
Lab.: 40%

Prerequisite: Biol. 311A or B.





BIOLOGY 415A
BIOLOGY OF NONVASCULAR PLANTS (3 credits)

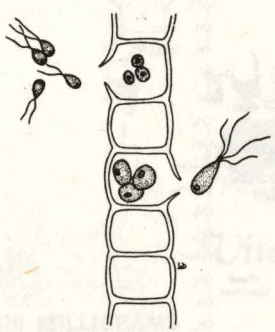
Instructor: To be announced.

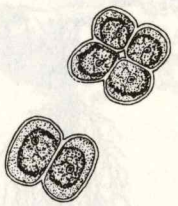
Description: A brief survey, through lecture and laboratory, of the classification by anatomical and other features, of the algae (marine and fresh water), the mosses and the liverworts, using common and not so common representatives of these important groups. Physiological, nutritional and other characteristics will also be considered. The skills of taxonomy will be emphasized during laboratory periods.

Text: To be announced.

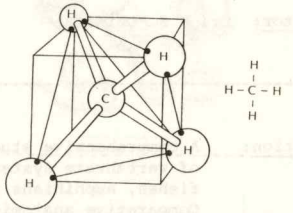
Grading: To be determined during the first week of the course.

Prerequisite: Biol. 311A or B.





BIOLOGY 417B
BIOLOGY OF VASCULAR PLANTS (3 credits)



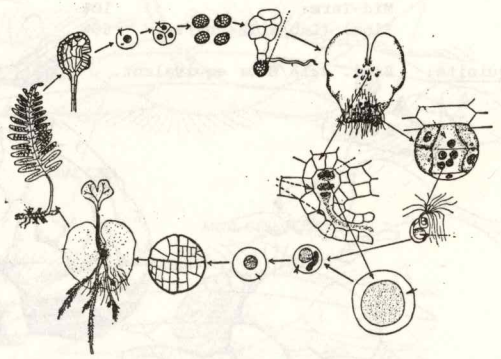
Instructor: To be announced.

Description: This course is the complementary one to Biol. 415A, but does not require the latter, and can be taken independently. The format is very similar to that described for the non-vascular plants, namely, a study of anatomical, life cycle, and other features essential to the classification and recognition of the most important ferns and fern-like plants, seed-bearing and flowering plants, bushes and trees. Morphological adaptations to various climates and conditions are studied, as well as anatomical peculiarities, physiological and nutritional requirements, etc. Taxonomic skills of preparation, preservation and observation will be stressed in the laboratory.

Text: To be announced.

Grading: To be determined during the first week of the course.

Prerequisite: Biol. 311A or B.



BIOLOGY 420Z
COMPARATIVE VERTEBRATE ANATOMY (6 credits)

Instructor: Dr. K.S. Dhindsa

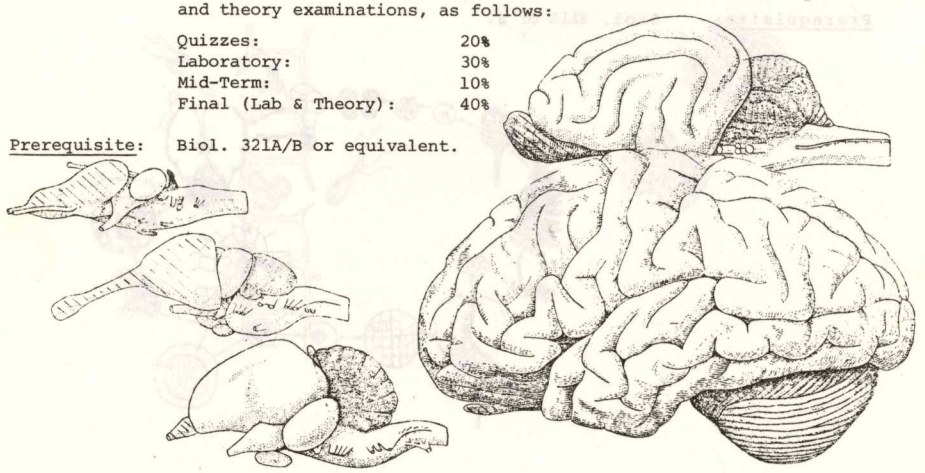
Description: A comprehensive study of the anatomy, development and evolution of vertebrate systems, from the lower chordates through the Agnathas, fishes, amphibians and the reptiles to the birds and mammals. Comparative anatomical changes are correlated with the adaptive radiations, evolutionary trends and biological/ecological systems of chordates. The lectures begin with an introduction of the nature, principles, domain of comparative anatomy and vertebrate pedigree. The comparative study of the vertebrate organ systems, for the various groups discussed are: integument and its derivatives, supporting tissue and the skeleton, muscles, body cavities, respiratory structures, alimentary systems, excretory and reproductive systems, circulatory systems, sense organs, nervous system, endocrine glands. The laboratories involve extensive morphological study and general survey of the major groups of chordates. Comparative study of the vertebrate systems through dissections (molgula, shark, turtle, pigeon and the cat), series of skeletons, prepared slides, preserved and mounted dissected specimens.

Text: The Vertebrate Body by A.S. Romer. W.B. Saunders Co.
Manual of Comparative Anatomy by B.M. Harrison. The C. Mosby Co.
Biology of the Vertebrates (A Supplement Manual) by K.S. Dhindsa.

Assignments & Grading: Grades are complied from the results of periodic quizzes, laboratory reports and demonstrations plus mid-term and final laboratory and theory examinations, as follows:

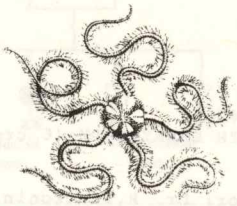
Quizzes:	20%
Laboratory:	30%
Mid-Term:	10%
Final (Lab & Theory):	40%

Prerequisite: Biol. 321A/B or equivalent.

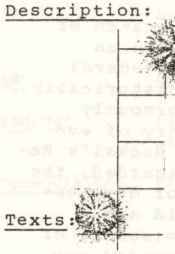


BIOLOGY 422Z
INVERTEBRATE ZOOLOGY (6 credits)

Instructor: Dr. J.D. McLaughlin



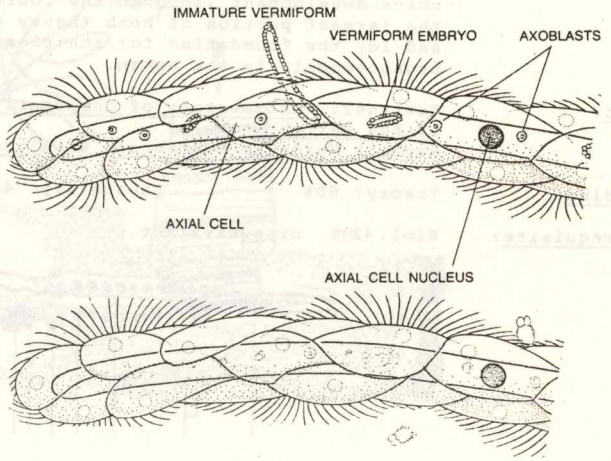
Description: A survey course designed to introduce the student to the vast array of invertebrate animals found in both terrestrial and aquatic ecosystems. Emphasis in lectures is placed on phylogeny, physiology of life processes, adaptations to a specific habitat and reproduction. Laboratory work stresses morphology of both living and preserved material and several laboratories deal with the behavior of selected specimens.



Texts: Barnes, R.T. Invertebrate Zoology, 3rd edition.

Assignments & Grading: Students are expected to keep an up-to-date laboratory note book. This will be examined periodically throughout each term. The theory and laboratory work each count for 50% of the final mark. Normally, exams are held only at Christmas and April with both theory and laboratory exams representing final exams for a respective term's work.

Prerequisite: Biol. 321A or B.



BIOLOGY 424Z
VERTEBRATE EMBRYOLOGY (6 credits)

Instructor: Dr. R.T. Cronin, S.J.

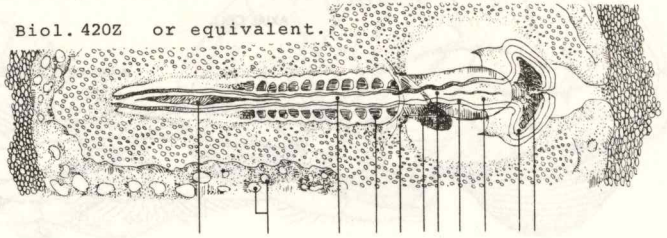
Description: The study of vertebrate embryology (a branch of Developmental Biology) is most helpful to an understanding of vertebrate anatomy in general and of human anatomy in particular. Historically, this branch of Biology contributed enormously to the formulation of the current theory of evolution of vertebrates. And, although Hackel's Recapitulation Theory has since been discarded, the comparative approach to the analysis of developmental stages of embryos is still valid and fruitful and has led to the recent blossoming of the experimental approach that has expanded our knowledge of the processes of cellular control, behaviour and differentiation.

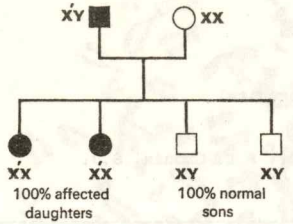
This is, of necessity, an introductory course, designed to acquaint the student with the phenomena of gamete formation, fertilization, and early development of selected invertebrates and prechordates while pursuing these same phenomena in greater detail in selected vertebrates. Methodical analyses of frog development (to the tadpole) and chick development (through the fourth day) occupy the largest portion of both theory and laboratory and lay the foundation for the closing study of organogenesis in the human.

Text: Huettner: Fundamentals of Comparative Embryology of the Vertebrates.
Rugh: A Guide to Vertebrate Development.

Grading: Theory: 60% Laboratory: 40%

Prerequisite: Biol. 420Z or equivalent.





BIOLOGY 430Z
GENERAL GENETICS (6 credits)

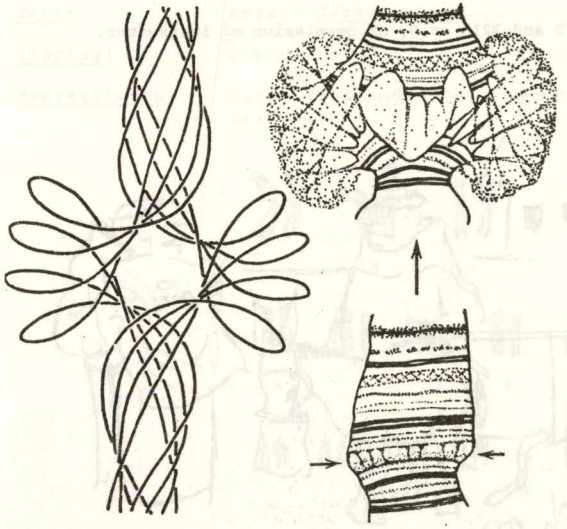
Instructor: Dr. C. Beckman

Description: A required course for Biology Majors, the course acquaints the student with the field of genetics. Historical and current topics are considered. Lectures, scheduled laboratories and independent work.

Text: General Genetics. Strickberger.

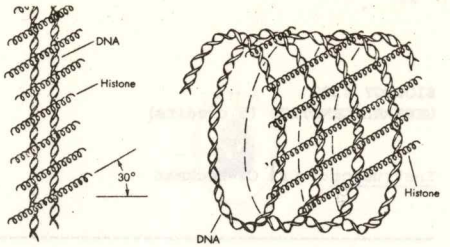
Grading: Six examinations: 70%
Laboratory work: 30%

Prerequisite: Biol. 311A or B and 321A or B.



BIOLOGY 431A
CYTOLOGY (3 credits)

Instructor: Dr. R.T. Cronin, S.J.



Description: Using a descriptive and comparative approach to the study of cell anatomy and physiology, this course is designed to acquaint the biology or biochemistry major in particular, with the fundamentals of living organization and activities in plant and animal cells.

While the laboratory is devoted to the preparation, observation, measurement and comparison of cells and cell products at light microscope levels, the lectures concentrate upon features and functions revealed by the electron microscope and biochemical and molecular methods of analyses. Cell division, differentiation, intercommunication as well as other vital processes are considered. Finally, time permitting, specialized animal cells (gametes, muscle, nerve, etc.) are examined in some detail.

Text: DeRobertis: Cell Biology.

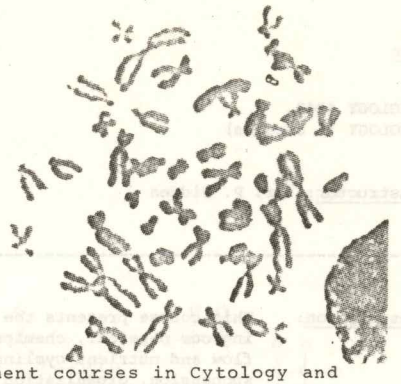
Grading: Theory: 70%. Laboratory: 30%.

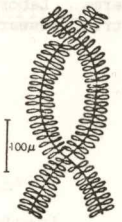
Prerequisite: Biol. 311A or B and 321A or B, or permission of instructor.

"With the new, vitamin-enriched formula, you'll get an additional five miles per feed bag."

BIOLOGY 433B
Cytogenetics (3 credits)

Instructor: Dr. R.T. Cronin, S.J.



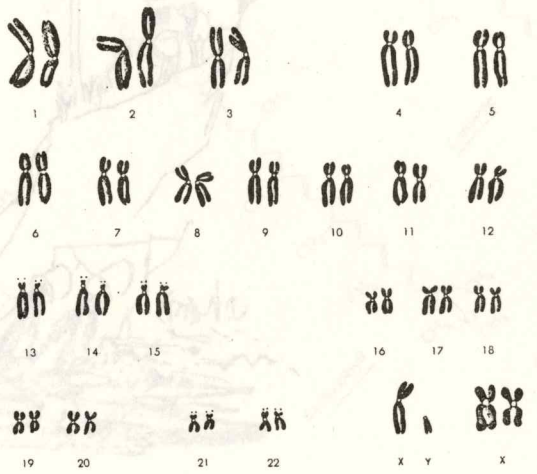


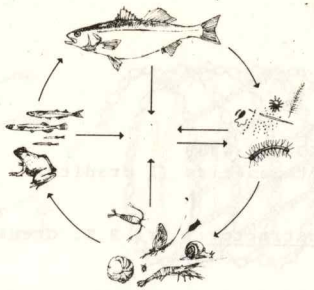
Description: Designed to complement courses in Cytology and in Genetics, this course may be described as a concentrated study of chromosomes, whether plant or animal, as to their structure, number and behaviour, both normal and abnormal, as well as their role in species formation and maintenance. Numerous examples from a vast and ever growing literature attest to the importance of this study to fields such as medicine and agriculture. The laboratory is devoted to acquiring skills in the simpler techniques of preparation and examination of representative plant and animal chromosomes.

Text: Brown: Cytogenetics.

Grading: Theory: 60% Laboratory: 40%

Prerequisite: Biol. 431A and 430Z, or permission of the instructor.





BIOLOGY 434Z
ECOLOGY (6 credits)

Instructor: Dr. P. Widden

Description: This course presents the fundamental concepts and principles governing our physical, chemical and biological environments: (energy flow and nutrient cycling, economy and efficiencies, adaptation and succession, organization and function of ecosystems, control and conservation, dynamics of populations, resources, waste cycling and pollution). Lectures: 3 hours per week for two terms. Laboratory: selected field trips for onsite sampling: industrial research visits; individual projects: seminars.

Text: Introduction to Ecology. Colinvaux. John Wiley, N.Y.

Grading:

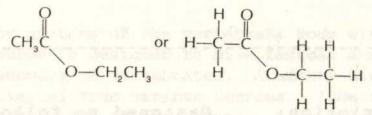
Plant Survey:	10%
Project:	30%
Mid term:	20%
Final:	40%

Prerequisite: Biol. 311A or B and 321A or B.

"What's the difference? It was a man-made lake in the first place."

BIOLOGY 435A
CELLULAR METABOLISM I (3 credits)

Instructor: Dr. B.S. Mangat

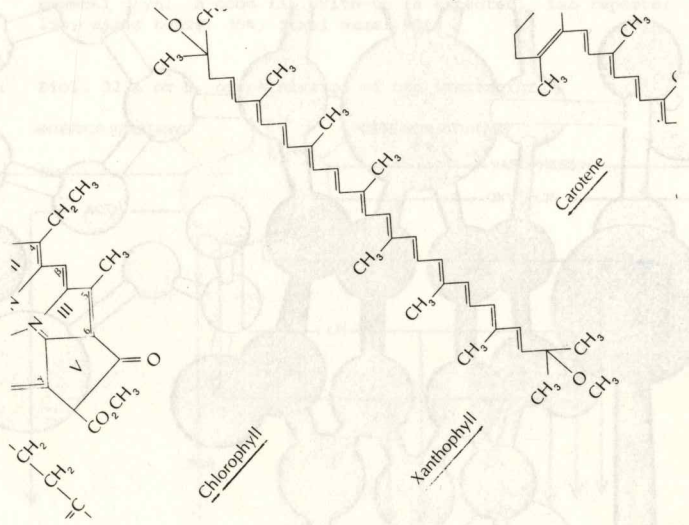


Description: This course is part of the core biology programme. The course will deal with the simple metabolism of biomolecules in both animals and plants. A basic study of enzymes and their mode of action; nucleic acids and their role in protein synthesis. Distribution of organelles and their metabolism; cellular oxidations and energetics. Lectures only.

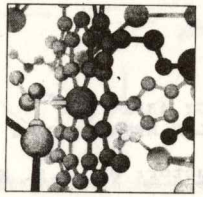
Text: To be assigned.

Grading: Two class tests and a final examination. Distribution of marks to be discussed in the first lecture.

Prerequisites: Biol. 311A/B, 321A/B and Chem. 326A, 328B.



BIOLOGY 437B
CELLULAR METABOLISM II (3 credits)



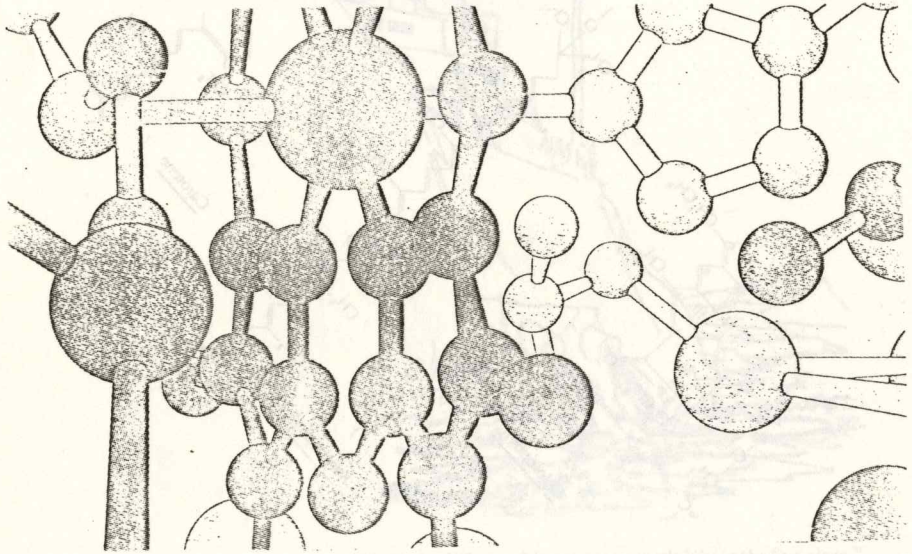
Instructor: Dr. B.S. Mangat

Description: Designed to follow Biol. 435A, the course examines the intracellular localisation of enzymes and their activity and control from a comparative cellular basis. Nucleotides and their importance in intermediary metabolism. Membrane function and cell-wall synthesis; hormones and their mode of action. Nutritional requirements of organisms. The course will consist of lectures and labs.

Text: To be assigned.

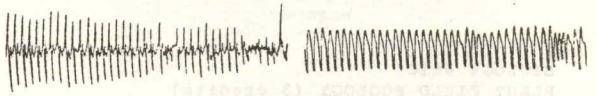
Grading: Distribution of the marks to be discussed in the first lecture.

Prerequisite: Biol. 435A.



BIOLOGY 440Z
ANIMAL PHYSIOLOGY (6 credits)

Instructor: Dr. N.N. Kapoor



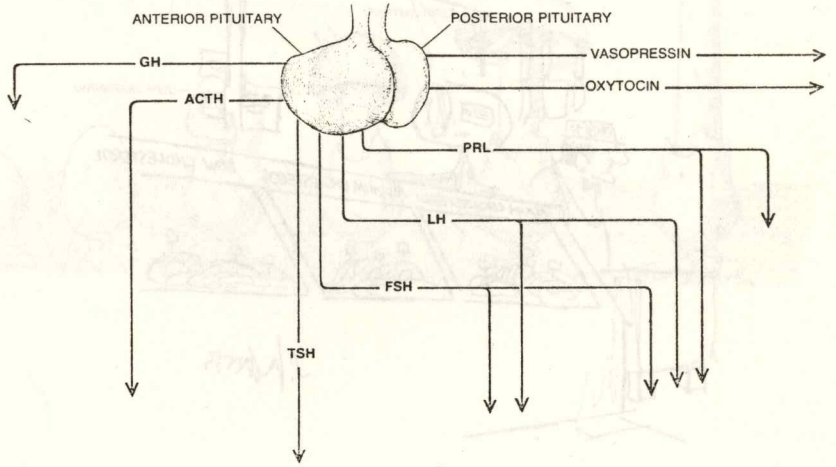
Description: The physiology of the major systems of the vertebrate body with emphasis on human. The course is designed to give factual knowledge of basic physiological phenomena of vertebrates. Students are encouraged to study the material from various sources. Labs are important and form an integral part of the course. Live animals are used for experiments which may involve basic instruments and some simple surgical procedures. Lectures and Lab.

Text: 1. Human Physiology by Vander et al. The McGraw-Hill.

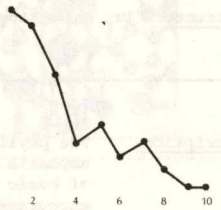
2. Laboratory Manual prepared by the professor.

Assignments & Grading: Some labs require a continuous group study of an experiment for several days. A good lab write-up is expected. Lab reports: 25%; class tests: 35%; final exam: 40%.

Prerequisite: Biol. 321A or B, or permission of the instructor.



BIOLOGY 461C
PLANT FIELD ECOLOGY (3 credits)

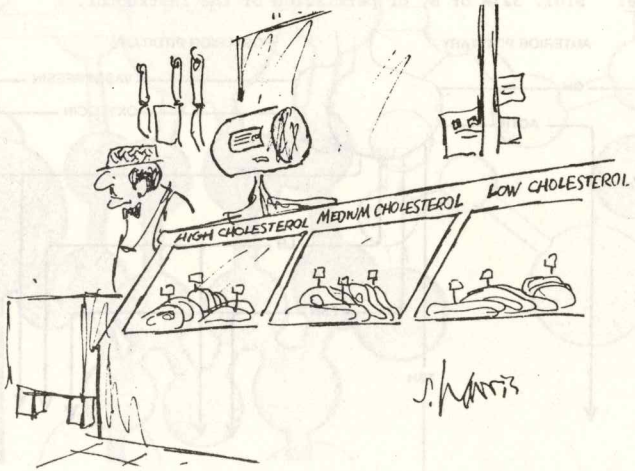


Instructor: Dr. P. Widden

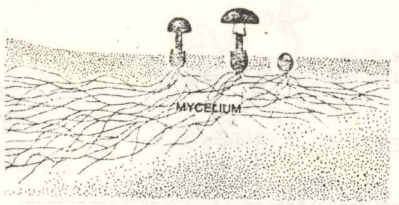
Description: This course will be held for a two week period during August, at the Loyola Lacolle Center, in the Eastern Townships of Quebec. It will involve the identification of local plant species, methods of sampling plant communities, and study of their pattern of distribution. The handling of data on populations and communities will be taught as well as statistical methods of analysis of population distributions. There will be a mixture of formal lectures, organized field studies and informal discussion. Further details are available in the Summer Calendar.

Grading: Students will be required to hand in a written report after the course has ended.

Prerequisite: Biol. 311A or B.



BIOLOGY 511A
MYCOLOGY (3 credits)



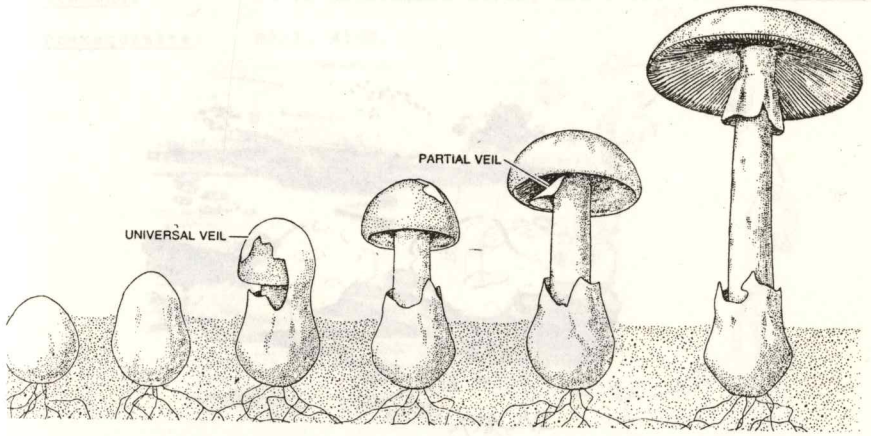
Instructor: Dr. P. Widden

Description: Morphology and taxonomy of fungi, their importance as pathogens of plants and animals, their role in the ecosystem as agents of decomposition and their use as food and producers of chemicals important to medicine and industry. Lectures: 2 hours per week for one term. Laboratory: 3 hours per week for one term.

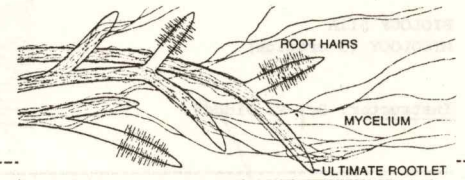
Text: Introduction to Fungi. Webster. Cambridge U. Press.

Grading:
Lab exam: 40%
Mid term: 20%
Final: 40%

Prerequisite: Biol. 315A.



BIOLOGY 513B
MICROBIAL ECOLOGY (3 credits)



Instructor: Dr. P. Widden

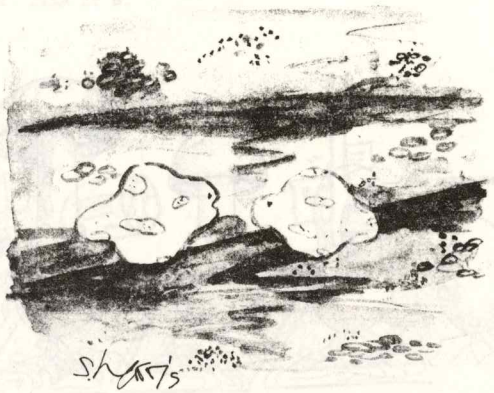
Description: The course is designed to give an understanding of the environment in which micro-organisms live, the structure of microbial communities, and the ways in which microbes interact during the processes involved in decomposition and nutrient cycling. Stress will be placed on the ecology of soil micro-organisms, though aquatic communities will also be discussed. Lectures: 2 hours per week for one term. Laboratory: 3 hours per week for one term, including field trips.

Text: Microbial Ecology. Brock. Prentice Hall.

Grading:

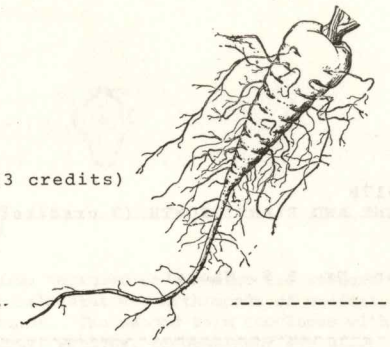
Seminar:	20%
Lab project:	20%
Mid term:	20%
Final:	40%

Prerequisite: Biol. 315A.



"I guess you can say that since Leeuwenhoek our family has been in show business."

BIOLOGY 515A
PLANT GROWTH & DEVELOPMENT (3 credits)



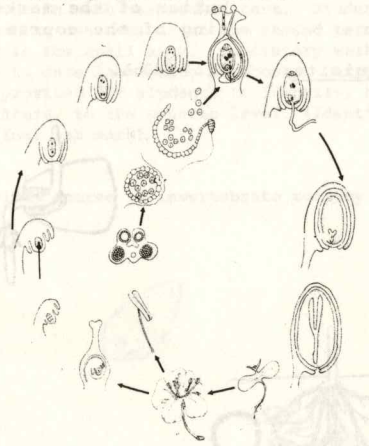
Instructor: Dr. R. Omran

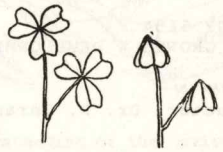
Description: Examination of the role of plant hormones and growth regulators on plant growth and development, the physiology of reproduction, differentiation and morphogenesis, maturation and senescence and light and temperature effects on plants. The laboratory covers a wide variety of experiments to study the role of plant hormones on plants at different stages of growth and tissue culture.

Text: Introduction to the Biochemistry and Physiology of Plant Growth Hormones by I.D. Phillips. McGraw-Hill.

Grading: To be determined during the first week.

Prerequisite: Biol. 410Z.





BIOLOGY 517B
ENVIRONMENT AND PLANT GROWTH (3 credits)

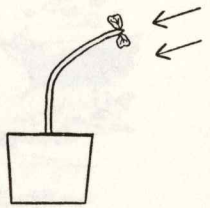
Instructor: Dr. B.S. Mangat

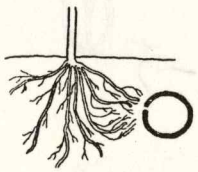
Description: The course will look at the responses of selected plant groups to different environmental conditions. Studies will include particular plant responses to changes in temperature and light, water, and mineral deficiencies. Effect of pollutants on plant growth. The course will consist of lectures, seminars, tutorials, and individual projects.

Text: To be assigned plus latest journal survey of articles pertinent to particular topics.

Grading: Evaluation based on project paper, seminar performance and a final 3 hour examination. Distribution of the marks to be discussed at the beginning of the course.

Prerequisite: Biol. 435A.





BIOLOGY 522Z
GENERAL PARASITOLOGY (6 credits)

Instructor: Dr. J.D. McLaughlin

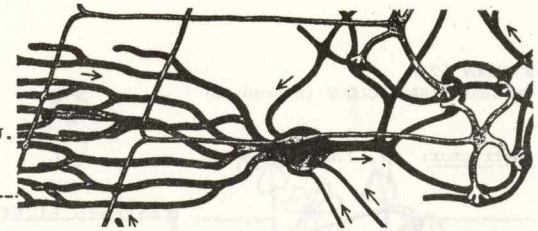
Description: An introductory course designed to acquaint the student with the parasitic protozoa, helminths and arthropods of medical, veterinary and wildlife importance. The second term concludes with discussions on parasite physiology, ecology, zoogeography evolution and host parasite relations. The laboratory provides practical training for the collection, preservation, staining and identification of parasitic animals, as well as autopsy techniques for various animals. Several experiments provide the student with a chance to work with living parasites and to observe their growth behavior and effect upon the host. Students will normally be involved in a project sometime throughout the year.

Text: Noble, E.R. & Noble, G.A. Parasitology, The Biology of Animal Parasites, 3rd edition and selected Journal references.

Assignments & Grading: Theory and laboratory work each comprise 50% of the final mark. Normally, there will be theory and laboratory finals at Christmas and April for work done in each respective term. Students have the option of presenting one seminar in the second term as part of their final mark in the April exam. Laboratory work includes the maintenance of an up to date laboratory notebook. During the term, specimens will be provided for students to identify, by means of available literature, to the generic level. (Identification constitutes 10% of the final lab mark).

Prerequisite: Biol. 321A or B. A previous course in invertebrate zoology is desirable.

BIOLOGY 524Z
NEUROBIOLOGY (6 credits)



Instructor: Dr. S.P. Drummond, S.J.

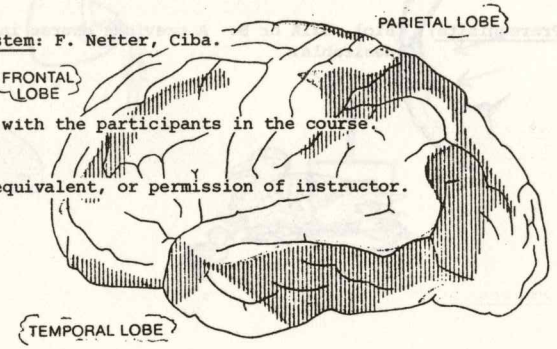
Description: This course is offered for those students with a background knowledge of vertebrate anatomy, who wish to pursue in greater depth the nervous system, with special emphasis on the human nervous system.

The first semester opens with a discussion of the embryology and gross anatomy of the central and peripheral nervous systems. Detailed study will be made of the neuron, the affectors and effectors. The laboratory work will include the dissection and appropriate microscopic study of the nervous system and sense organs in the shark.

The second semester will be devoted to a detailed study of the mammalian neurological pathways: a) the afferent system b) the efferent system c) the association system. The course will include discussions of: a) reflex behaviour b) the learning process c) the nervous system and intellect d) emotions and the limbic system e) abnormal and pathological problems. Laboratory work will include dissections of the mammalian brain, demonstrations of human dissections, microscopic study of selected mammalian and human material.

The nervous system not only exercises a primary controlling function over all the other systems of the body, but also subserves the intellectual activity of the human mind. As a result, this course can lead to some degree of personal enlightenment and development. Human behaviour is multi-faceted. A knowledge of its neurological foundations will shed light on the understanding of principles in the areas of logic, morality, law, religion. Pragmatically, the course should appeal to anyone whose interests lie in the fields of behaviour, learning, teaching, communication.

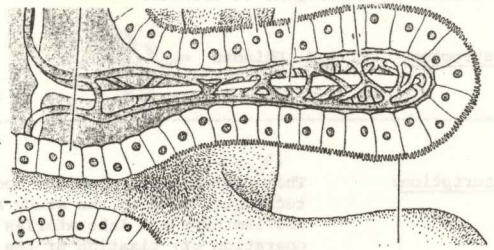
Text: The Nervous System: F. Netter, Ciba.



Assignments & Grading: To be arranged with the participants in the course.

Prerequisite: Biol. 420Z or equivalent, or permission of instructor.

BIOLOGY 527A
HISTOLOGY (3 credits)



Instructor: Dr. K.S. Dhindsa

Description: The theory consists of a comparative study of the microscopic characteristics and organization of cells, tissues and organs of the vertebrates. The histology of the following tissues is interrelated with their ultrastructure, histochemistry and physiology of cell organelles: modern concept of cell and principles of histological studies, epithelial tissues, connective and supporting tissues (cartilage and bone), muscular tissue, the integument, histology of digestive tract and glands, circulatory system - blood and lymph, histology of respiratory system, histology of excretory system, nervous tissue, brain and sense organs, histology of endocrine glands. The laboratories consist of a survey and study of the principle tissues through prepared slides. Laboratory outlines are handed out in class.

Text: Essentials of Histology by G. Bevelander and J.A. Ramaley. The C.V. Mosby Company.

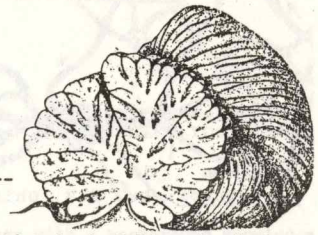
Reference List
A Text Book of Histology by Bloom and Fawcet. W.B. Saunders Co.
An Atlas of Human Anatomy by M.S.H. DiFiore. Lea and Febigen.
Atlas of Microscopic Anatomy by Bergmen and Afifi. W.B. Saunders Co.
Histology by Leeson and Leeson. W.B. Saunders Co.

Assignments & Grading: Grades are compiled on the results of periodic quizzes, laboratory reports and final lab and theory examinations, as follows:

Quizzes:	20%
Laboratory:	30%
Final (Laboratory):	20%
Final (Theory):	30%

Prerequisite: Biol. 420Z or equivalent or permission of the instructor.

BIOLOGY 529B
MICROSCOPICAL TECHNIQUES (3 credits)



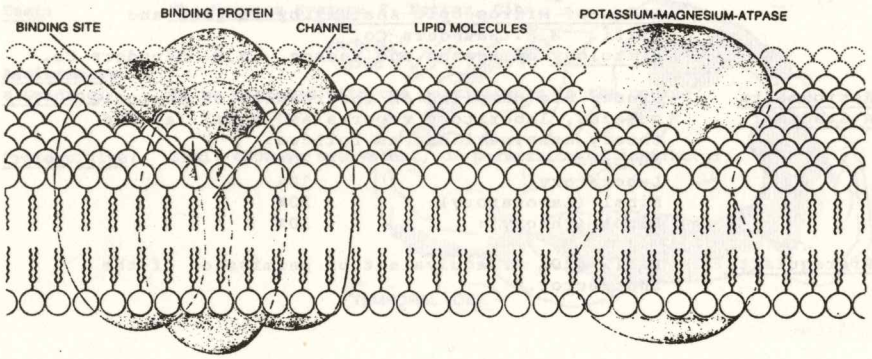
Instructor: Dr. K.S. Dhindsa

Description: This course deals with the modern histological/histochemical techniques used in the study and preparation of animal tissues. The lectures and laboratories deal with the theory and actual operation of: fixation of the mammalian tissues, the biochemical characteristics of histological fixatives, the theory and biochemistry of staining and various kinds of histological stains, methodology and instrumentation of tissue sectioning, interpretation and identification of the cell organelles, organic constituents of cells (nucleic acids - RNA, DNA; proteins, carbohydrates, lipids...) with specific staining methods. Techniques of autoradiography, principles of photomicrography. The students work in teams and are expected to submit a complete report of the methods followed along with photomicrographs of the tissues prepared. Periodic progress reports of the work carried out are also submitted.

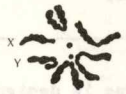
Text: Microscopical Techniques by K.S. Dhindsa.
Microtechnique by R. Willey. The MacMillan Co.

Assignments & Grading: Grades are compiled on the basis of reports, assignments and the manual dexterity/precision, demonstrated in the techniques carried out.

Prerequisite: Biol. 527A.



BIOLOGY 531A/B
ADVANCED GENETICS (3 credits)



Instructor: Dr. C. Beckman

Description: A half course for the student who is interested in genetic research. The course is a survey of some of the literature. Content varies with the interests of the student. Any topic related to genetics might be considered. Lectures, student siminars, films and group discussion.

Text: The Molecular Biology of the Gene by Watson is required reading.

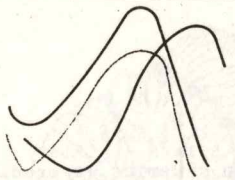
Assignments & Grading: Seminars, term paper, and final examination in essay form.

Prerequisite: Biol. 430 or the equivalent.

"As I see it, it's a toss-up between a Belgian data processing machine and an American electronic computer."

BIOLOGY 542Z
COMPARATIVE ANIMAL PHYSIOLOGY (6 credits)

Instructor: Dr. N. Kapoor

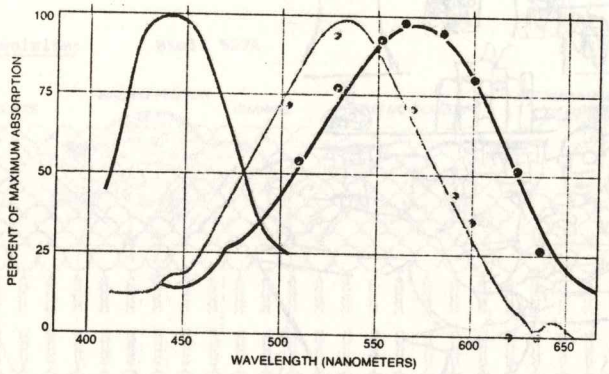


Description: This course is designed at the upper-class undergraduate level. It is assumed that students have already acquired the basic principles of physiology, the phyla and classes of animals. The course is organized on a function-system basis, and deals with a comparative study of physiological processes in animals; their behaviour and physiological adaptations. The student will learn special techniques to perform laboratory investigations, and will learn scientific writing methods.
Lectures, seminars and laboratory.

Texts: Comparative Animal Physiology by C. L. Prosser. W. B. Saunders Company Canada Limited, Toronto.

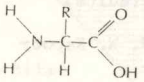
Assignments & Grading: Lab reports: 20 % ; class test in December: 20 % ; seminars: 20 % , evaluation is by review papers and seminar performance; final examination: 40 %.

Prerequisite: Biology 440Z or equivalent, Biology 437B or equivalent Biochemistry, or permission of the instructor.



BIOLOGY 565A
LIMNOLOGY (3 credits)

Instructor : Dr. N. Kapoor

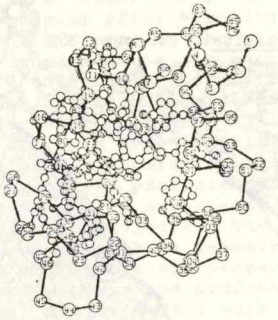


Description: A survey course covering physical and chemical properties of freshwater, the biotic communities of lakes and running water. Lectures only.

Texts: To be announced.

Assignments & Grading : To be determined in the class

Prerequisite: Biology 434Z



"The devil with the food chain. I *like* mercury."

BIOLOGY 567B
FISH BIOLOGY (3 credits)

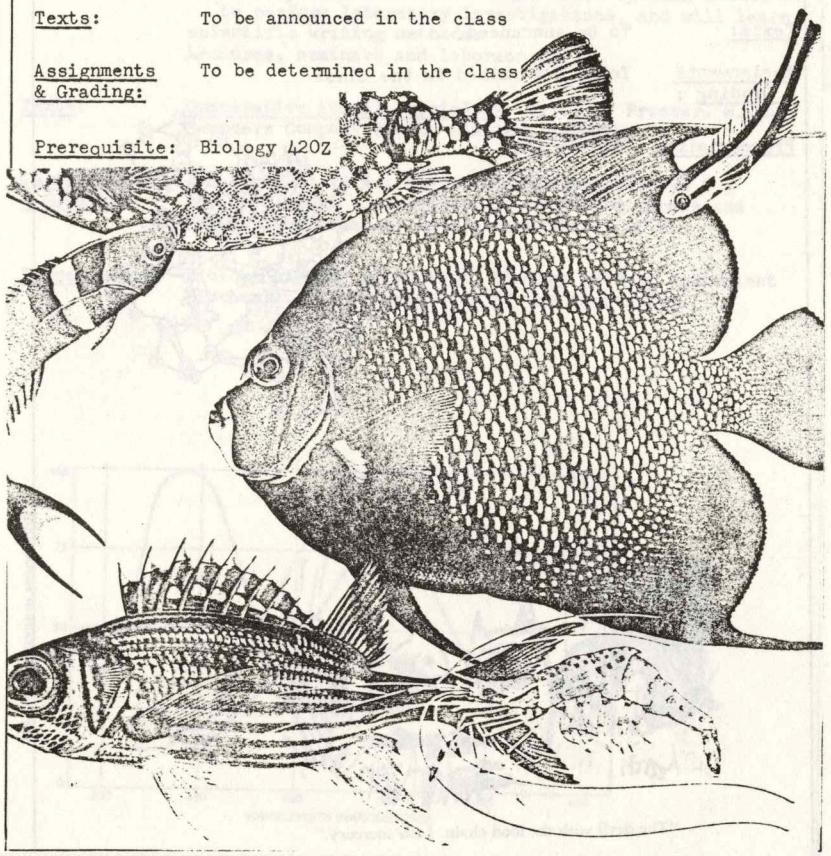
Instructor : Dr. N. N. Kapoor

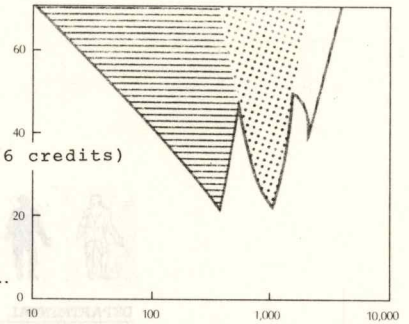
Description: A study of the physiological and morphological characteristics of fish; their feeding and mating behaviour, and special adaptations. Lectures only.

Texts: To be announced in the class

Assignments & Grading: To be determined in the class

Prerequisite: Biology 420Z





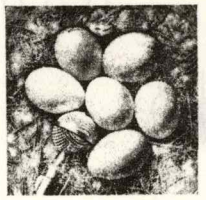
BIOLOGY 590Z
PROBLEMS IN BIOLOGICAL RESEARCH (6 credits)

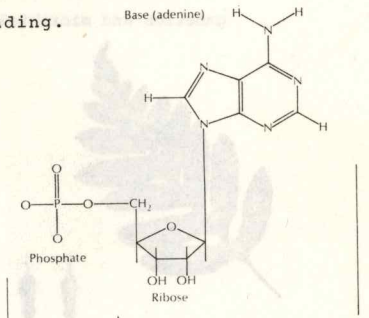
Instructor: Biology Faculty

Description: Unfortunately this course is open only to our Honours students, and requires of them what is usually referred to as a Senior Thesis. There are no formal lectures or laboratory, but the individual Honours students after becoming acquainted with the research interests of the various professors on staff, choose their own mentor from among these, and undertakes a significant research project under his or her guidance and tutelage. In the course of this most satisfying endeavour, it is hoped that the student will demonstrate his or her interest, acquired skills, knowledge and general proficiency, while at the same time acquiring new experience and expertise and specialized knowledge. The agony and the ecstacy of literature research, drafting and writing the report and presenting this orally before one's peers and professors completes the course. The student's work is overseen by an Honours Thesis Committee including two other professors.

Grading: Determined by the Honours Committee.

Prerequisite: Honours Degree standing.





DEPARTMENTAL FACILITIES

Teaching laboratories in botany, zoology, microbiology, genetics, physiology (both plant and animal), parasitology and entomology; small museum.

Special facilities in histology and microtechnique (including photographic labs and electron microscope); small animals, birds and insect rearing rooms; greenhouses and tissue culture chambers.

Research facilities in insect neurophysiology, avian parasitology, histochemistry, plant physiology and biochemistry, animal physiology, behavioral genetics and microbial ecology.